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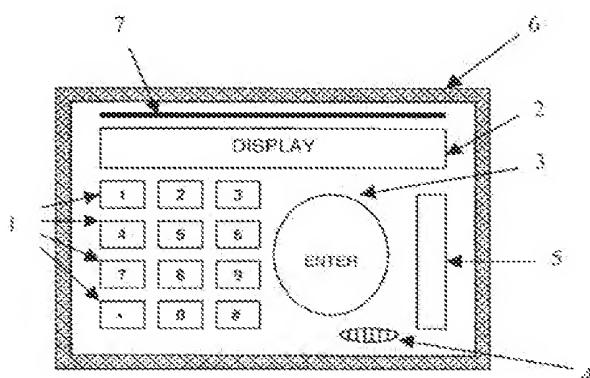
— with international search report

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For two-letter codes and other abbreviations, refer to the "Guide-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: ELECTRONIC CREDIT CARD - ECC

A drawing of ECC physical form covering SAC with PIN control using a  
combination of infra-red, radio frequency and magnetic induction telecommunication  
devices. Drawing is not to scale.



(57) Abstract: Electronic Credit Card (ECC) is an electronic device that enables transmission/reception of data and/or digital information to/from a host computer via a Terminal Station (TS). TS includes Teller Machines in supermarkets/shopping complex, Automatic Teller Machines (ATM), EFTPOS devices and proprietary transceiver devices developed by Creative On-Line Technologies Limited for PC interface. It provides latest financial information including balances on its display unit. Keypads (1) enable PIN (personal identification number) entries so that an ECC is operational. Information Display Unit (2) including an LCD (liquid crystal display) screen or other display screens provides visual information. ENTER key (3) confirms a transaction. It is also used to activate an ECC when a PIN is keyed. Audio Transducer (4) confirms entries made on keypad (1). Audio Transducer is also used to activate a financial transaction via a telephone. Data transmission/reception is via Infra-red (5), Magnetic (6) and Radio Frequency (7) devices.

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## ELECTRONIC CREDIT CARD - ECC

This invention relates to the provision of a secure, controlled, and reliable transaction of funds using electronic controlled credit card.

The present credit card environment and systems have the following shortfalls:

- 9      1. When a credit card is reported stolen or lost by a holder, he or she has to contact the company or organisation that issued the card to cancel the card in order to prevent illegal transactions. Such action may not occur immediately if the holder is unaware that his or her card is missing.
- 10     2. The present security measures undertaken by credit card companies and/or organisations through the use of 'smart card' technology are inadequate to prevent frauds. Similarly the use of holography images on credit cards does not eliminate frauds too.
- 15     3. The use of a signature as a validation control may be overlooked and can be forged.
- 16     4. The technology behind its usage is outdated and not suitable for a secure transaction via the Internet.
- 17     5. It does not prevent hackers who penetrate the 'secure web sites' to make use of credit card details for frauds.
- 20     6. Giving a merchant or merchants credit card details is like giving him or her a 'signed blank cheque'. Credit card companies or organisations are not efficient when dealing with insincere merchants.

The electronic credit card - ECC (hereafter known as ECC) is an invention that eliminates the shortfalls in the present credit card system.

25     ECC is only operational through one of the following process (hereafter known as SAC [security authorisation code]):

1. A user controlled PIN (personal identification number) and/or
2. A user identified fingerprint signature (digital signature) and/or
3. A user eyeball retina signature (digital signature).

30     Such process can be self-contained in an ECC or via a database in a local or remote system.

An audio transducer is used to confirm a successful process via a PIN, fingerprint and eyeball retina scan signature of an ECC holder.

35     ECC has a self-contained timer that deactivates its SAC after an elapsed time. This feature eliminates a stolen ECC from being used when a PIN and/or digital signature is already activated.

An ECC is self-destructed if a pre-determined number of attempts are made to gain access to its operation in sending SAC. This is to prevent frauds in the event that an ECC is stolen. The authorising distributor could re-initialise an ECC through its control management system that is used to issue ECC.

- s ECC can be disabled at a Transaction Station (hereafter known as TS) through a system control function controlled by an issuing company or organisation. This enables immediate termination of an ECC if required.

ECC is an intelligent device that communicates with TS via one of the following modes or a combination of the following modes:

- 10 1. Infra-red telecommunication process (Figure 4) and/or  
2. Radio frequency telecommunication process (Figure 5) and/or  
3. Magnetic induction telecommunication process (Figure 6) and/or  
4. Wire contact telecommunication (Figure 7) process.

15 ECC has the capability to download information to a computer system via one of its telecommunication modes above. This ensures data integrity at the time of power source replacement or charging. Furthermore it also facilitates transactional history.

20 ECC has the capability to generate its own transaction number either in sync with an TS link to a local or remote site system control function or independently. TS may or could be an Internet site with such capability.

25 ECC financial limit can be verified via TS with link to a local or remote site system control function. This controls an ECC from generating further transactions once its financial limit is reached. This function of limiting funds is an optional mode that can be either activated by the financial institution that issue the ECC or by the holder to cross check and alert him or her of his or her account balance.

ECC can transact funds to and from an Automatic Teller Machine (ATM) via an ATM management system (this is shown at Figure 3). This enables ECC to provide and support a cash-less society. ECC can also be linked to a Personal Computer (PC) to provide and support such transactions (this is shown at Figure 2).

30 ECC can transact electronic cash instead of credit card/debit card account to a TS. This can be used as a currency exchange device so that a traveller going aboard can choose to have a set amount of specific currency in the country he or she is visiting.

35 ECC prevents merchants from using unauthorised transaction as each transaction can only be generated by an ECC with its unique transaction identifier. Merchants cannot generate a unique transaction identifier.

ECC can be incorporated in an electronic device or equipment. An example of such incorporation is in a mobile phone.

ECC keypads may be made from flex-board membrane, rubber, and/or plastic materials to provide durability and slim size. Keypads may be designed with round or square buttons.

s ECC can be incorporated with a strip of magnetic tape at the back with keypads on the front to facilitate SAC telecommunications. The audio transducer can be used as a telecommunications device to send SAC via a telephone line to a merchant with TS facility to process a transaction.

ECC sending SAC uses a unique transaction identifier for each transaction.

10 ECC can be used to store more than one credit card/debit card account. These can be cards distributed from different financial institutions/organisations/companies.

ECC can retain the credit card/debit card approved credit card/debit card financial limit and provide the user (customer) the information regarding his or her financial balance of his or her account limit outstanding. This is available to one or more credit card/debit card account(s).

15 Drawings Numbering Definitions:

- 1: Keypad for PIN entry and transactions.
- 2: Information Display Unit.
- 3: ENTER key to enable (confirm) a transaction (security access).
- 4: Audio transducer.
- 5: Infra-red telecommunication device.
- 6: Magnetic telecommunication device.
- 7: Radio frequency telecommunication device (antenna).
- 8: Wire Contact telecommunication device.
- 9: Magnetic Tape strip with coded information.
- 10: Fingerprint scanner pad for transaction entry (security access).
- 11: Eyeball retina scanner pad for transaction entry (security access).
- 12: Scanner Entry Key

## CLAIMS

The claims defining the invention are as follows:

1. Electronic Credit Card - ECC is an Intelligent Card. It is an electronic device capable of sending and receiving information in an electronic mode. The device is able to communicate with a host computer that is either a mainframe or personal computer (PC) with its internal devices.

2. ECC is only operational through one of the following process (hereafter known as SAC [security authorisation code]):

- A user controlled PIN (personal identification number) and/or
- A user identified fingerprint signature (digital signature) and/or
- A user eyeball retina signature (digital signature).

Such process can be self-contained in an ECC or via a database in a local or remote system.

An audio transducer is used to confirm a successful process via a PIN, fingerprint and eyeball retina scan signature of an ECC holder.

3. ECC has a self-contained timer that deactivates its SAC after an elapsed time. This feature eliminates a stolen ECC from being used when a PIN and/or digital signature is already activated.

4. An ECC is self-destructed if a pre-determined number of attempts are made to gain access to its operation in sending SAC. This is to prevent frauds in the event that an ECC is stolen. The authorising distributor could re-initialise an ECC through its control management system that is used to issue ECC.

5. ECC can be disabled at a Transaction Station (hereafter known as TS) through a system control function controlled by an issuing company or organisation. This enables immediate termination of an ECC if required.

ECC is an intelligent device that communicates with TS via one of the following modes or a combination of the following modes:

- Infra-red telecommunication process (figure 4) and/or
- Radio frequency telecommunication process (figure 5) and/or
- Magnetic induction telecommunication process (figure 6) and/or
- Wire contact telecommunication (figure 7) process.

6. ECC has the capability to download information to a computer system via one of its telecommunication modes above. This ensures data integrity at the time of power source replacement or charging. Furthermore it also facilitates transactional history.

7. ECC sending SAC uses a unique transaction identifier for each transaction.

8. ECC can be incorporated in an electronic device or equipment. An example of such incorporation is in a mobile phone.
9. ECC has the capability to generate its own transaction number either in sync with an TS link to a local or remote site system control function or independently. TS may or could be an Internet site with such capability.
10. ECC financial limit can be verified via TS with link to a local or remote site system control function. This controls an ECC from generating further transactions once its financial limit is reached. This function of limiting funds is an optional mode that can be either activated by the financial institution that issue the ECC or by the holder to cross check and alert him or her of his or her account balance.
11. ECC can transact funds to and from an Automatic Teller Machine (ATM) via an ATM management system (this is shown at Figure 3). This enables ECC to provide and support a cash-less society. ECC can also be linked to a Personal Computer (PC) to provide and support such transactions (this is shown at Figure 2).
12. ECC can transact electronic cash instead of credit card/debit card funds to a TS. This can be used as a currency exchange device so that a traveller going aboard can choose to have a set amount of specific currency in the country he or she is visiting.
13. ECC prevents merchants from using unauthorised transaction as each transaction can only be generated by an ECC with its unique transaction identifier. Merchants cannot generate a unique transaction identifier.
14. ECC keypads may be made from flex-board membrane, rubber, and/or plastic materials to provide durability and slim size. Keypads may be designed with round or square buttons.
15. ECC can be incorporated with a strip of magnetic tape at the back with keypads on the front to facilitate SAC telecommunications. The audio transducer can be used as a telecommunications device to send SAC via a telephone line to a merchant with TS facility to process a transaction.
16. ECC can be used to store more than one credit card/debit card account. These can be cards distributed from different financial institutions/organisations/companies.
17. ECC can retain the credit card/debit card approved credit card/debit card financial limit and provide the user (customer) the information regarding his or her financial balance of his or her account limit outstanding. This is available to one or more credit card/debit card account(s).

Figure 1: A drawing of ECC physical form covering SAC with PIN control using a combination of infra-red, radio frequency and magnetic induction telecommunication devices. Drawing is not to scale.

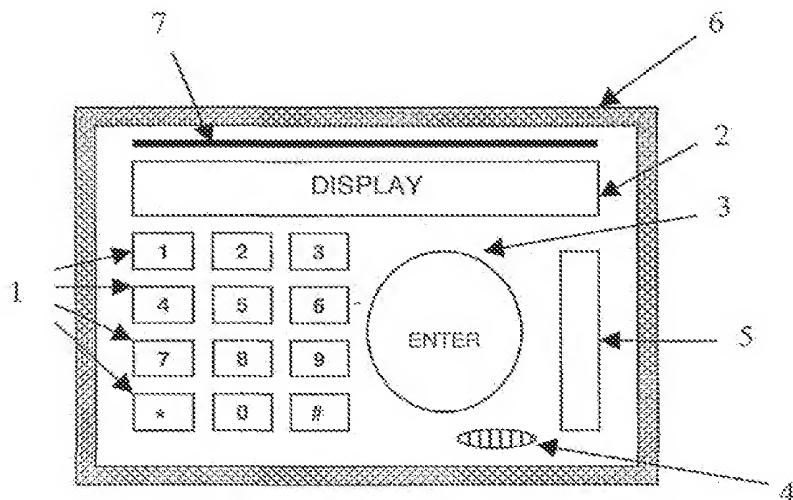


Figure 2: A drawing of ECC communications link to PC and Mainframe Computer. Drawing is not to scale.

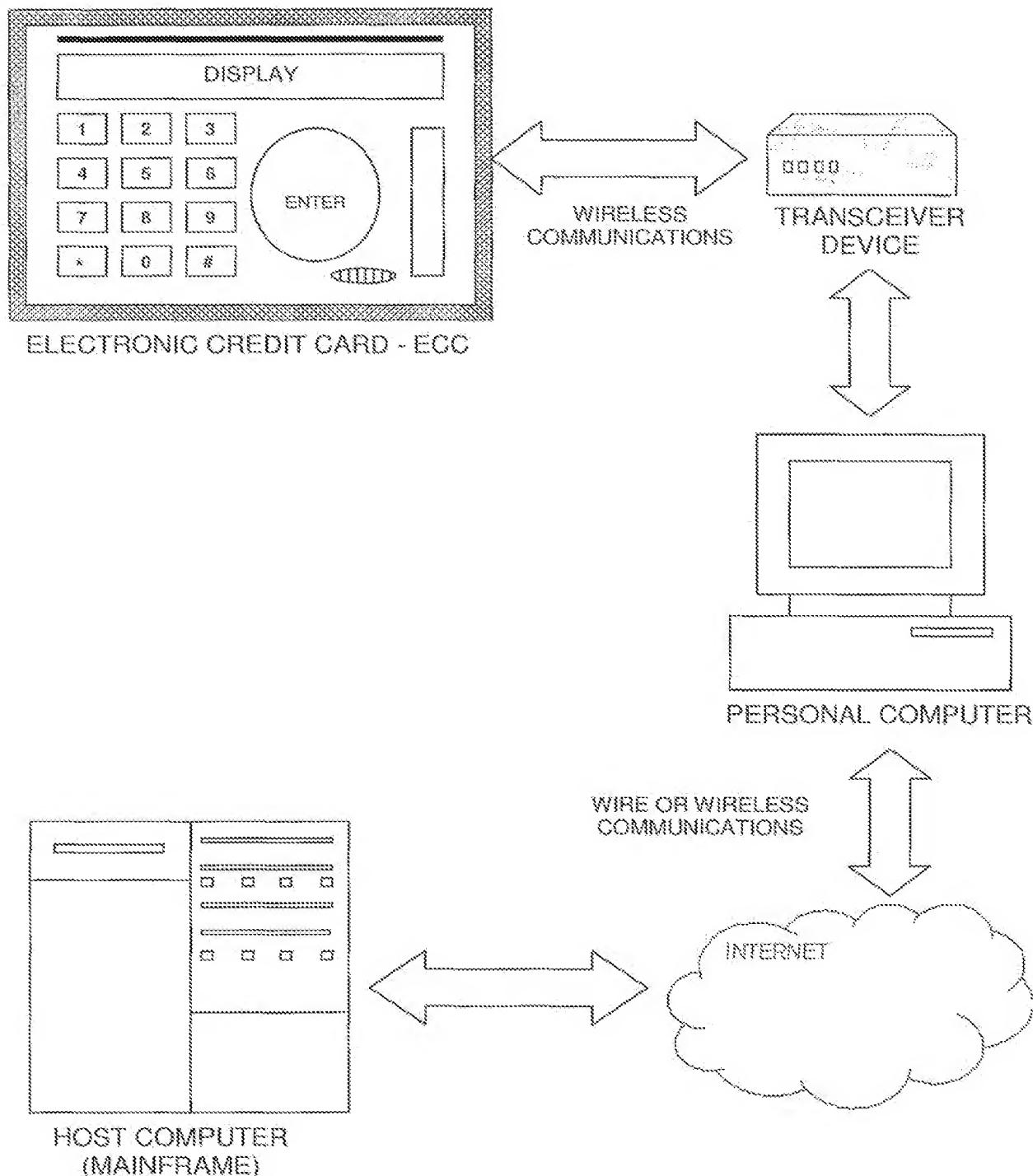
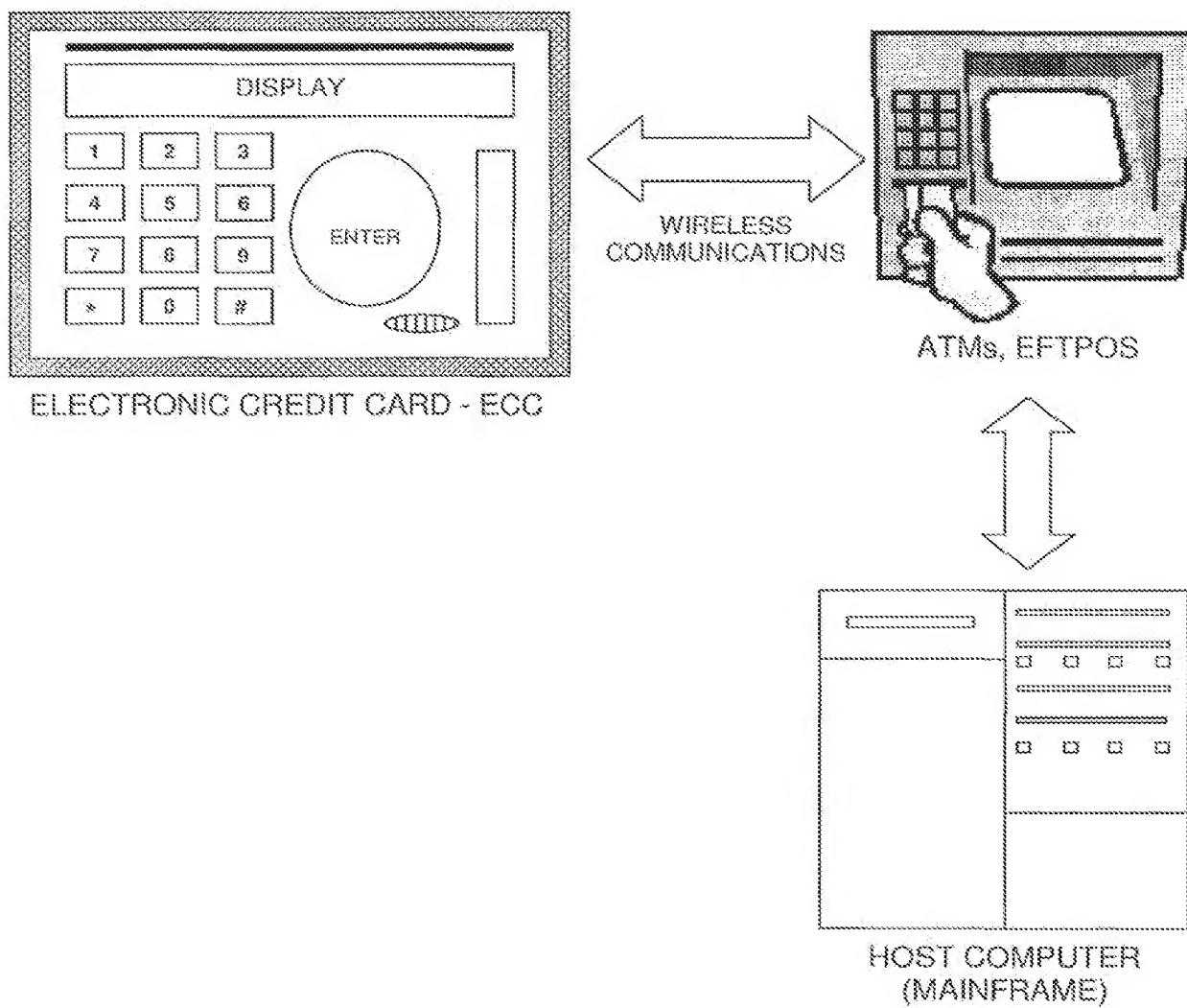


Figure 3: A drawing of ECC communications link to Teller Machines, ATMs, EFTPOS and Host Computer. Drawing is not to scale.



A view of ECC physical form is shown at Figure 4 to 12:

Figure 4: A drawing of ECC physical form covering SAC with PIN control using infrared telecommunication device. Drawing is not to scale.

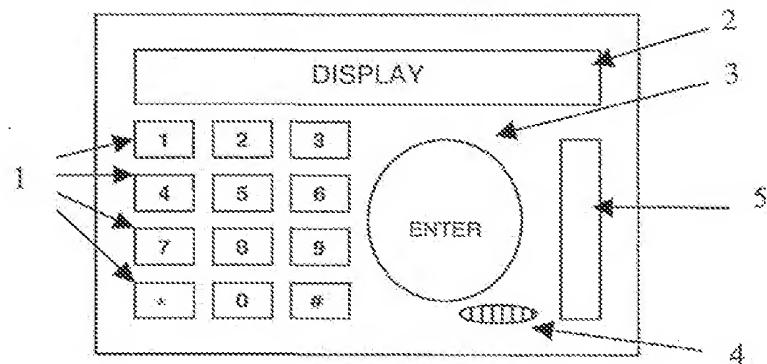


Figure 5: A drawing of ECC physical form covering SAC with PIN control using radio frequency telecommunication device. Drawing is not to scale

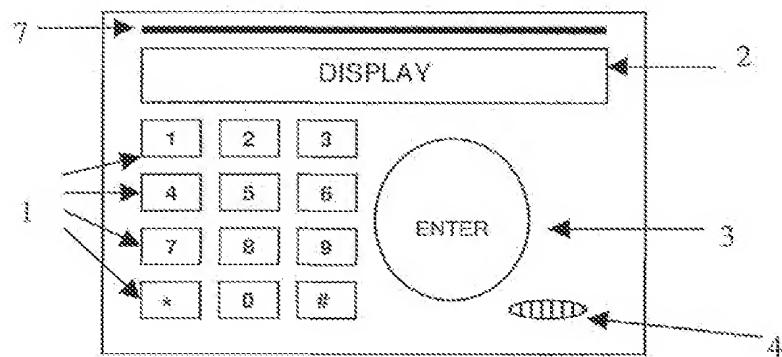


Figure 6: A drawing of ECC physical form covering SAC with PIN control using magnetic induction telecommunication device. Drawing is not to scale.

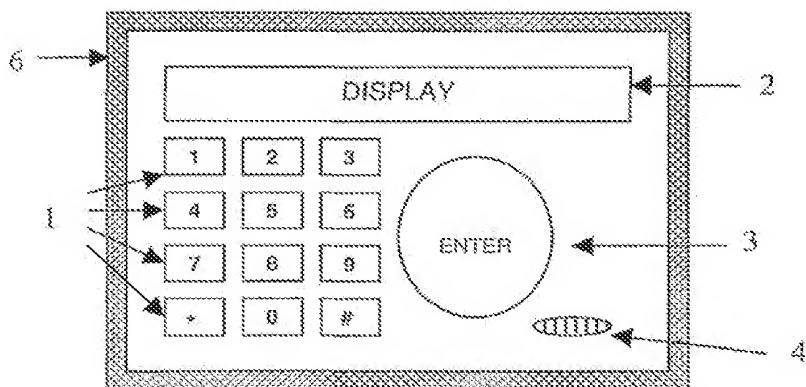


Figure 7: A drawing of ECC physical form covering SAC with PIN control using wire contact telecommunication device. Drawing is not to scale.

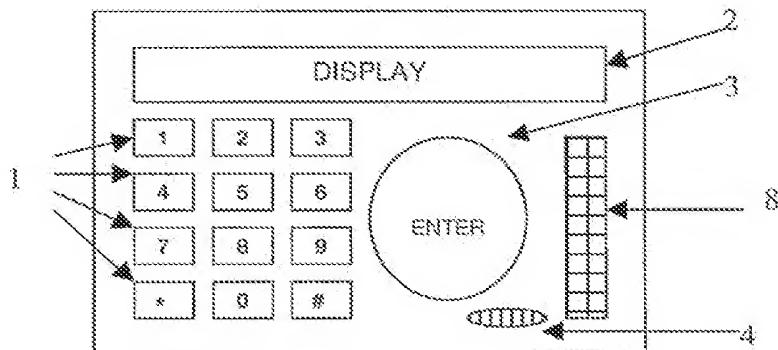


Figure 8: A front view drawing of ECC physical form covering SAC with PIN control using magnetic strip telecommunication device. Drawing is not to scale.

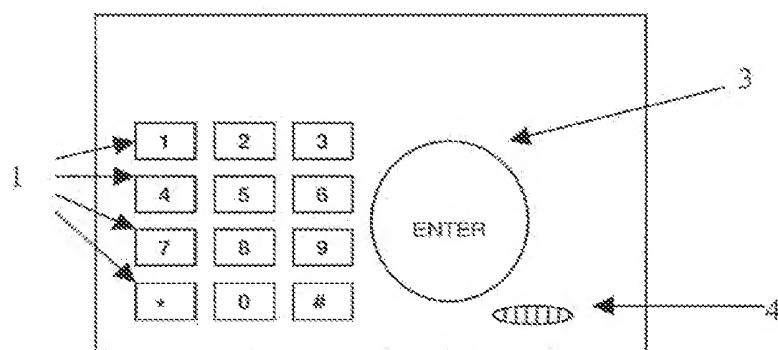


Figure 9: A rear front view drawing of ECC physical form covering SAC with PIN control using magnetic strip telecommunication device. Drawing is not to scale.

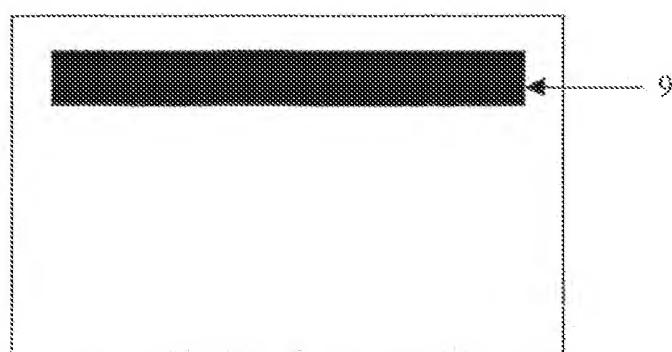


Figure 10: A drawing of ECC physical form covering SAC with PIN control using a combination of infra-red, radio frequency and magnetic induction telecommunication devices. Drawing is not to scale.

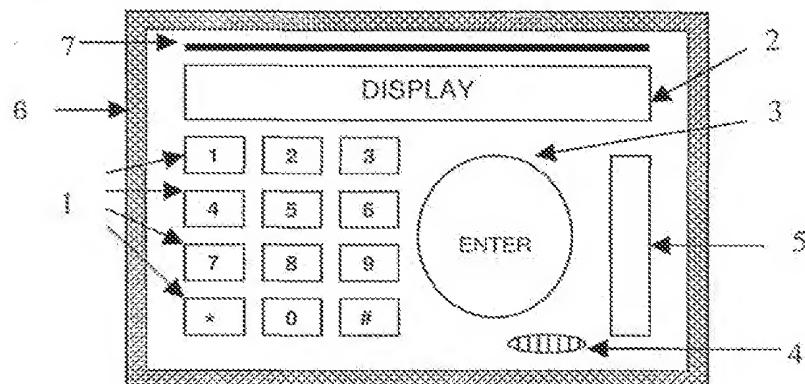


Figure 11: A drawing of ECC physical form covering SAC with finger print scanner pad with a combination of infra-red, radio frequency and magnetic induction telecommunication devices. Drawing is not to scale.

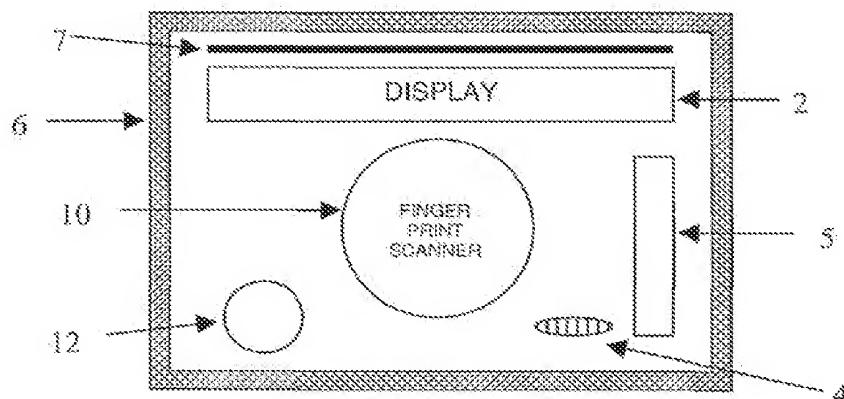
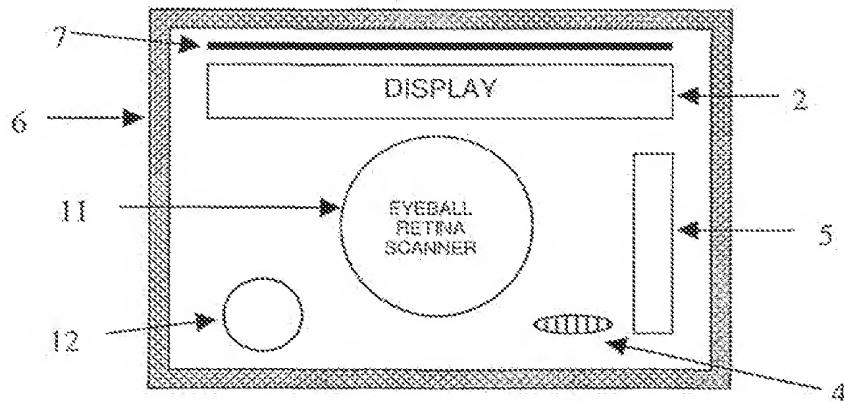


Figure 12: A drawing of ECC physical form covering SAC with eyeball retina scanner pad with a combination of infra-red, radio frequency and magnetic induction telecommunication devices. Drawing is not to scale.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU91/00170

**A. CLASSIFICATION OF SUBJECT MATTER**

Int. Cl.?: G06K 19/073, 9/00; G07F 19/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC: G06K; G07F 19/00; G06F 17/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU: IPC AS ABOVE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT: SMART, CREDIT, DEBIT, IC, INTEGRATED CIRCUIT, EFTPOS, FUND?, TRANSFER, CARD+, PIN, DIGITAL, SIGNATURE, FINGERPRINT, RETINA?, RETINA SCAN, SECUR+, AUTHORITY+, FRAUD+

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 805424 A (INTERNATIONAL GAME TECHNOLOGY) 5 November 1997 Entire document	I-17
X	GB 2204971 A (GENERAL ELECTRIC COMPANY PLC.) 23 November 1988 Entire document	I-17
X, Y	WO 98/092227 A ((SMARTTOUCH INC.) 5 May 1998 Entire document	I-17

Further documents are listed in the continuation of Box C     See patent family annex

* Special categories of cited documents:	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"A" Document defining the general state of the art which is not considered to be of particular relevance		
"E" earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means		
"P" document published prior to the international filing date but later than the priority date claimed	"X&Y"	document member of the same patent family

Date of the actual completion of the international search

18 May 2001

Date of mailing of the international search report

1 June 2001

Name and mailing address of the ISA/AU  
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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU01/00179

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	GB 2346239 A (INTERNATIONAL BUSINESS MACHINES CORPORATION) 2 August 2000 Entire document	1-17
X, Y	WO 99/31621 A (SMARTTOUCH INC.) 14 June 1999 Entire document	1-17
P, X, Y	WO 00/46710 A (SMARTTOUCH INC.) 10 August 2000 Entire document	1-17
X	JP 11-167553 A (NARUYAMA) 22 June 1999 Abstract	1, 2, 5-17
Y	Abstract	3, 4
X	JP 99-044619 A (CANON KABUSHIKI KAISHA) 14 February 1997 Abstract	1, 2, 5-17
Y	Abstract	3, 4
P, Y	WO 00/45247 A (SMARTTOUCH INC.) 3 August 2000 Entire document	1-17
X	GB 2310069 A (NEC CORPORATION) 13 August 1997 Entire document	1-17

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/AT/01/00170

## Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos :

because they relate to subject matter not required to be searched by this Authority, namely:

2.  Claims Nos : 1-17

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

The claims are not drafted in a manner that succinctly encompass one inventive concept. All 17 claims have been cast as independent claims, directed to different aspects of the described invention. Even then, the technical features that these claims define are not clearly evident. As such, it is unclear as to exactly what the features characterising the invention are, and exactly what the bounds of the monopoly sought are. It appears that use of dependent claims would be useful.

3.  Claims Nos :

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

## Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Subsequent to Box I paragraph 2 above, the application could well be considered to be directed to 17 sets of different "special technical features". The application would therefore lack unity, and contravene rule 40.

This authority considers claim 2, although not entirely succinct, to possibly represent the broad inventive concept, as main claim 1 is considered much too broad and speculative as to include known credit/debit/smart cards within its scope. Claim 2 is consistent with what appears to be the statement of the invention at lines 24-30 of the first page, and considered the main invention in accordance with rule 68.5. The search report has been conducted on this basis. *The documents subsequently cited are considered to be merely representative of prior art that fall within the scope of the application as the claims stand.*

1.  As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
  
  
4.  No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

## Remark on Protest

- The additional search fees were accompanied by the applicant's protest.

- No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.  
PCT/AU91/00170

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
EP	803424	AU	19134/97	CA	2202689	US	5902983
WO	9809227	AU	43295/97	US	3870723	US	6012039
		US	6154879	US	5615277	US	5613012
		US	5764789	US	5802199	US	5805719
		US	5838812	AU	59226/96	BR	9608580
		CA	2221321	CN	1191927	EP	912959
		WO	9636934	AU	200036965	WO	200067187
		AU	200034767	WO	200046710	AU	200034818
		WO	200046737	AU	48023/97	WO	9815924
		AU	65624/98	WO	9841947		
GB	2346239	JP	2000222362				
WO	9931621	AU	19300/99				
WO	200045247	AU	200028644				
GB	2310069	AU	12571/97	CA	2196947	JP	9212565
		US	6098055				

END OF ANNEX